FIG. 1

CONSTRUCTION OF IEEE 1394 BUS TO WHICH
CONVENTIONAL BUS ANALYZER IS CONNECTED
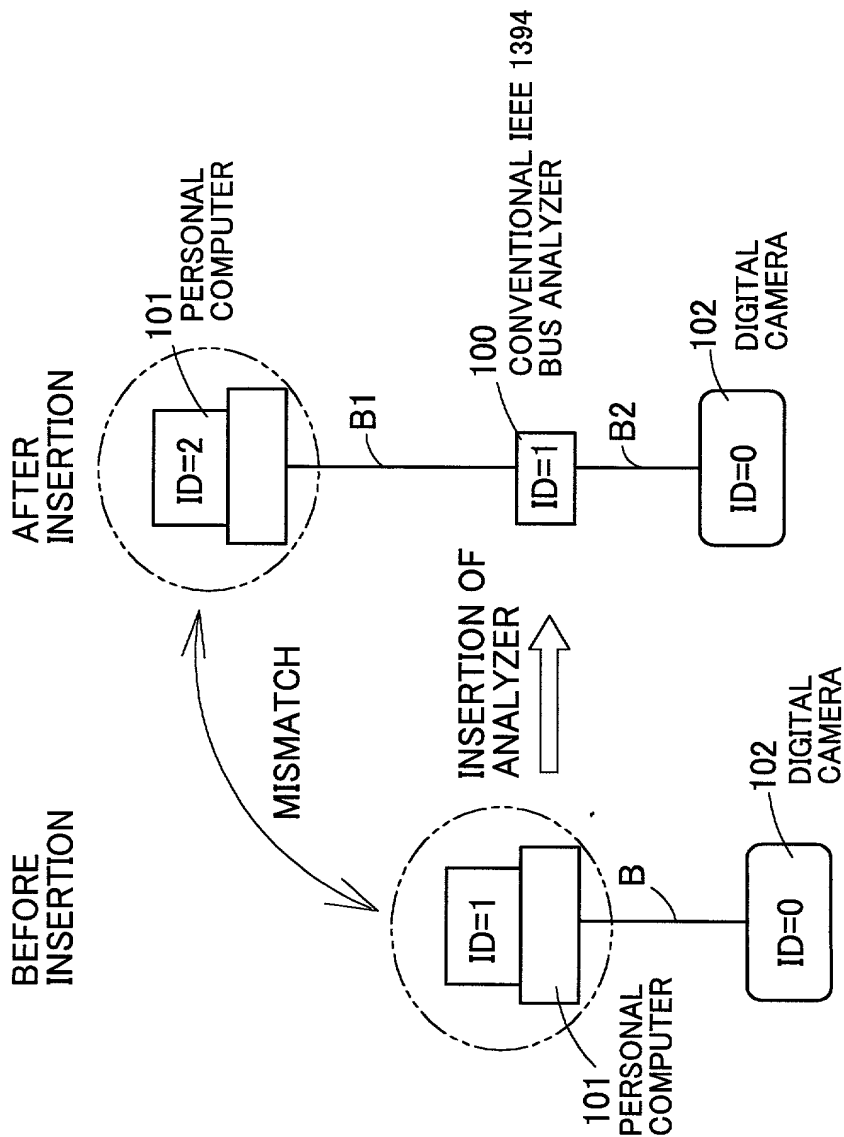
BEFORE
INSERTION

AFTER
INSERTION

MISMATCH

INSERTION OF ANALYZER

101 PERSONAL COMPUTER

ID=1

B

ID=0

102 DIGITAL CAMERA

101 PERSONAL COMPUTER

ID=2

B1

100 CONVENTIONAL IEEE 1394 BUS ANALYZER

ID=1

B2

102 DIGITAL CAMERA

ID=0

FIG. 2

CONSTRUCTION IN WHICH CONVENTIONAL BUS ANALYZER IS
CONNECTED TO IEEE 1394 BUS TO WHICH A NUMBER OF
DEVICES ARE CONNECTED

BEFORE
INSERTION

ID=1
DEVICE
C

ID=6
DEVICE
G

ID=5
DEVICE
H

ID=0
DEVICE
A

BB

ID=4
DEVICE
B

ID=7
DEVICE
F

ID=8....n
OTHER DEVICES

ID=3
DEVICE
D

ID=2
DEVICE
E

INSERTION OF ANALYZER

AFTER
INSERTION

ID=2
DEVICE
C

ID=7
DEVICE
G

ID=6
DEVICE
H

ID=0
DEVICE
A

BB1

BB2

ID=5
DEVICE
B

ID=8
DEVICE
F

ID=9....n
OTHER DEVICES

ID=1

ID=4
DEVICE
D

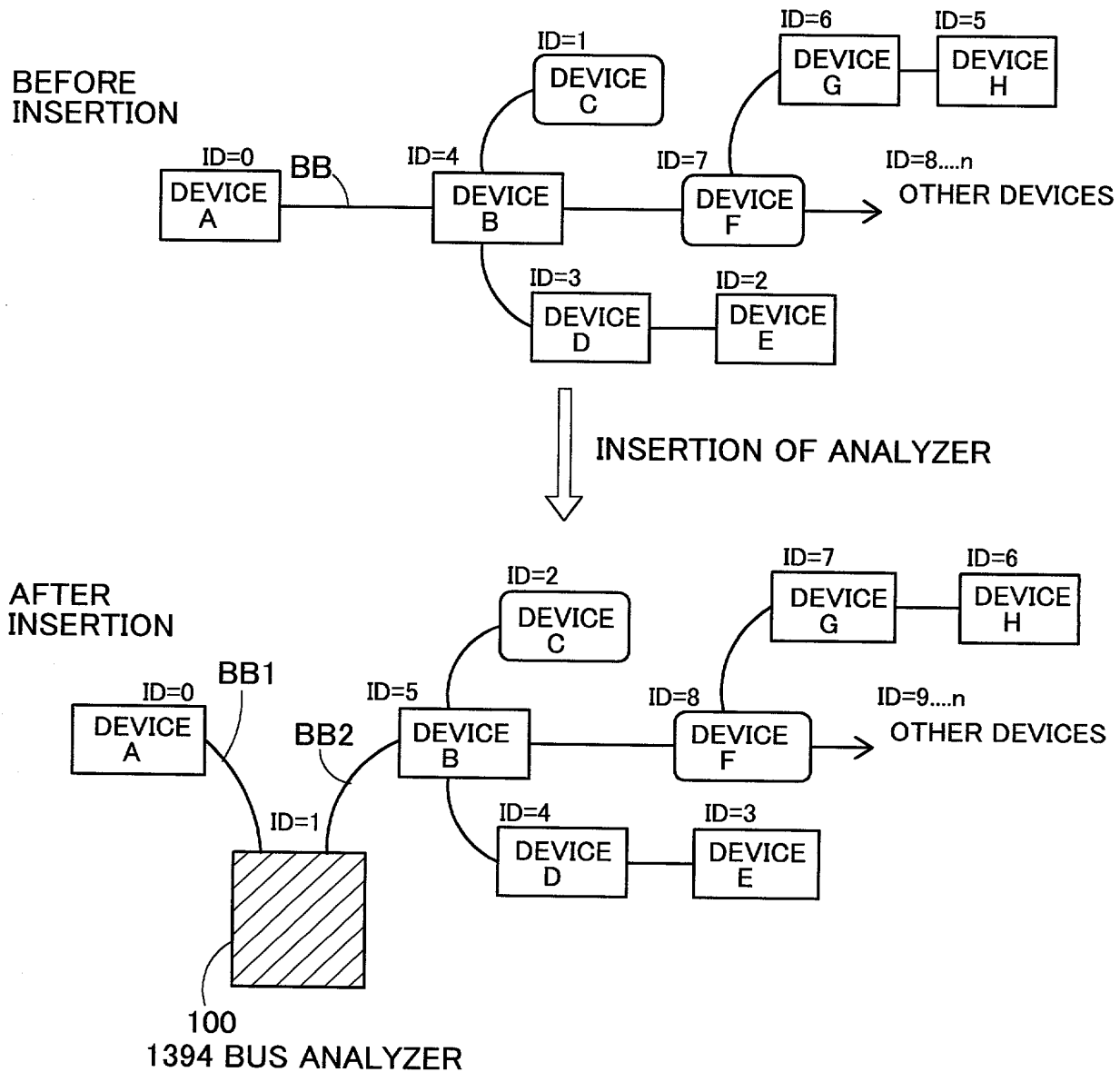ID=3
DEVICE
E

100
1394 BUS ANALYZER

FIG. 3

CONSTRUCTION IN WHICH BUS ANALYZER OF FIRST EMBODIMENT
IS CONNECTED TO IEEE 1394 BUS

FIG. 4

STATE TRANSITION DIAGRAM SHOWING TREE-IDENTIFYING OPERATIION
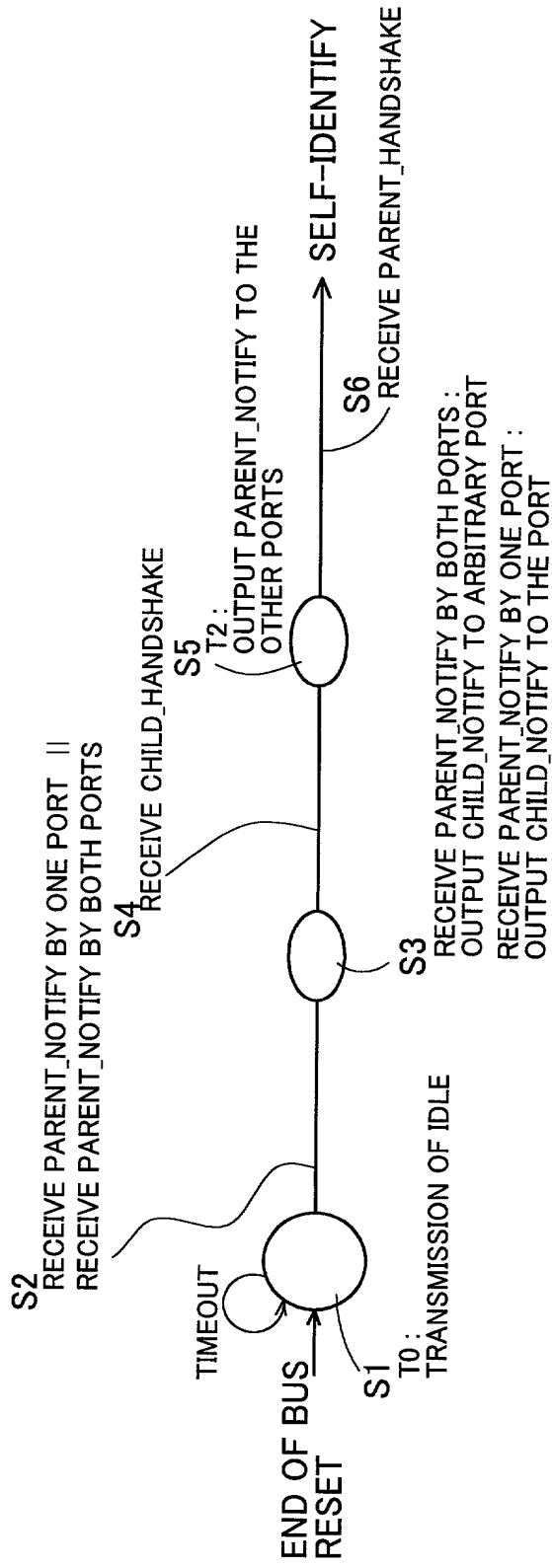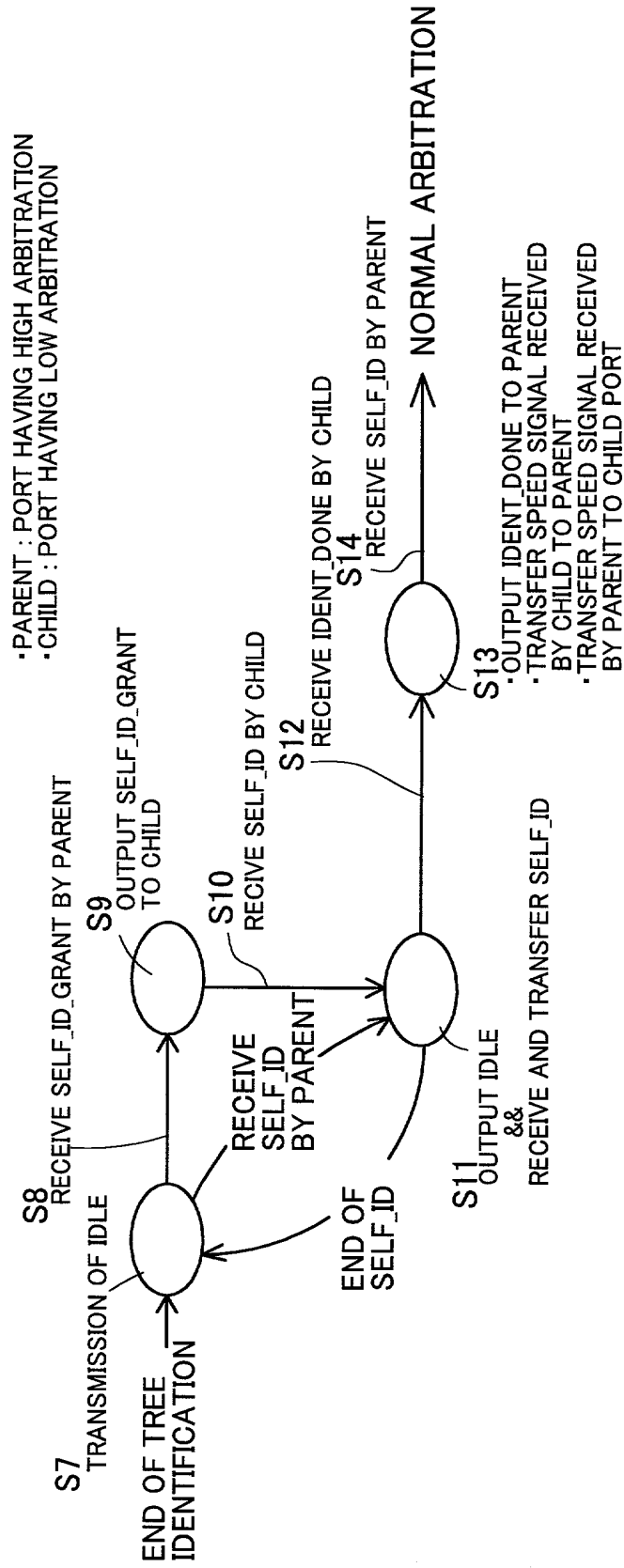IN FIRST EMBODIMENT

S2
RECEIVE PARENT_NOTIFY BY ONE PORT ‖
RECEIVE PARENT_NOTIFY BY BOTH PORTS

S4
RECEIVE CHILD_HANDSHAKE

S5
T2 :
OUTPUT PARENT_NOTIFY TO THE
OTHER PORTS

S6
RECEIVE PARENT_HANDSHAKE

SELF-IDENTIFY

S3
RECEIVE PARENT_NOTIFY BY BOTH PORTS :
OUTPUT CHILD_NOTIFY TO ARBITRARY PORT
RECEIVE PARENT_NOTIFY BY ONE PORT :
OUTPUT CHILD_NOTIFY TO THE PORT

TIMEOUT

END OF BUS
RESET

S1
T0 :
TRANSMISSION OF IDLE

FIG. 5

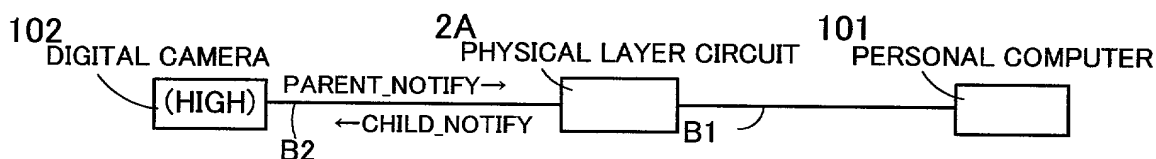STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING
OPERATION IN FIRST EMBODIMENT

・PARENT : PORT HAVING HIGH ARBITRATION
・CHILD : PORT HAVING LOW ARBITRATION

S7
END OF TREE
IDENTIFICATION

TRANSMISSION OF IDLE

S8
RECEIVE SELF_ID_GRANT BY PARENT

S9
OUTPUT SELF_ID_GRANT
TO CHILD

RECEIVE
SELF_ID
BY PARENT

S10
RECIVE SELF_ID BY CHILD

END OF
SELF_ID

S11
OUTPUT IDLE
&&
RECEIVE AND TRANSFER SELF_ID

S12
RECEIVE SELF_ID BY CHILD

RECEIVE IDENT_DONE BY CHILD

S14
RECEIVE SELF_ID BY PARENT

NORMAL ARBITRATION

S13
・OUTPUT IDENT_DONE TO PARENT
・TRANSFER SPEED SIGNAL RECEIVED
BY CHILD TO PARENT
・TRANSFER SPEED SIGNAL RECEIVED
BY PARENT TO CHILD PORT

FIG. 6

TREE-IDENTIFYING OPERATION IN FIRST EMBODIMENT
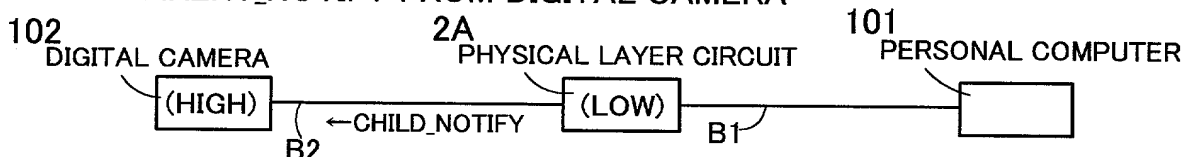(RECEIVE PARENT_NOTIFY BY ONE OF PORTS)

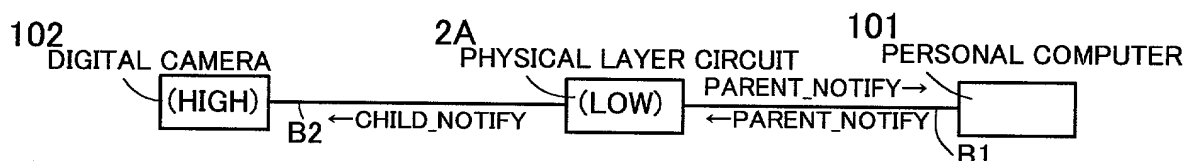(P1) RECEIVE PARENT_NOTIFY FROM DIGITAL CAMERA
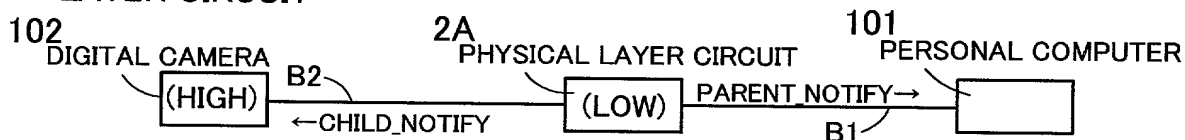

(P2) OUTPUT CHILD_NOTIFY TO DIGITAL CAMERA

(P3) RECEIVE CHILD_HANDSHAKE BY STOPPING OUTPUT
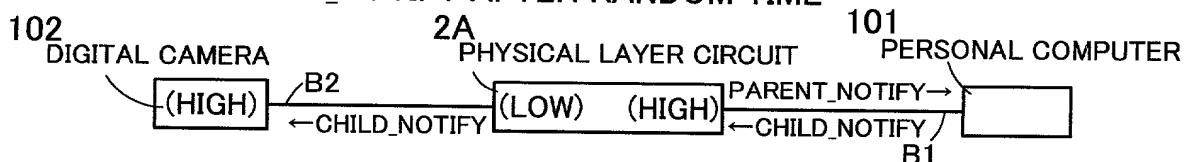OF PARENT_NOTIFY FROM DIGITAL CAMERA

(P4) OUTPUT PARENT_NOTIFY TO THE OTHER PORT RECEIVE
ROOT_CONTENTION WHEN PERSONAL COMPUTER ALSO OUTPUTS
PARENT_NOTIFY AT THIS TIME

(P5) STOP OUTPUTTING PARENT_NOTIFY FROM PERSONAL COMPUTER
BUT CONTINUOUSLY OUTPUT PARENT_NOTIFY FROM PHYSICAL
LAYER CIRCUIT

(P6) RECEIVE PARENT_HANDSHAKE WHEN PERSONAL COMPUTER
OUTPUTS CHILD_NOTIFY AFTER RANDOM TIME

(P12) STOP OUTPUTTING SIGNALS FROM BOTH PORTS, THEREBY
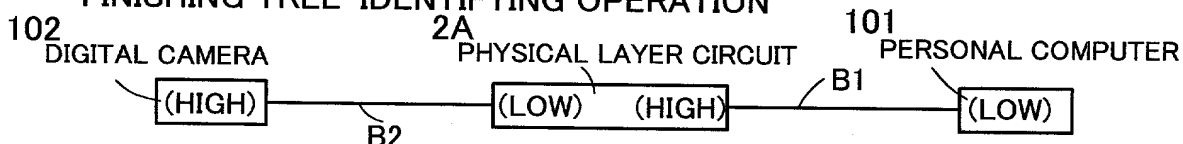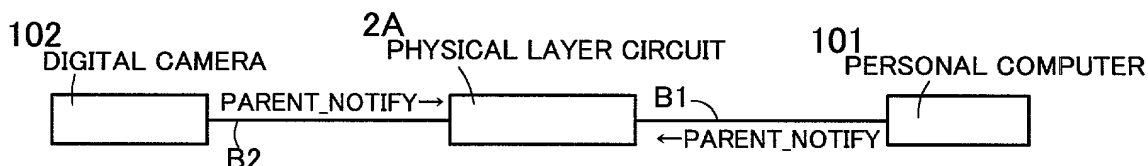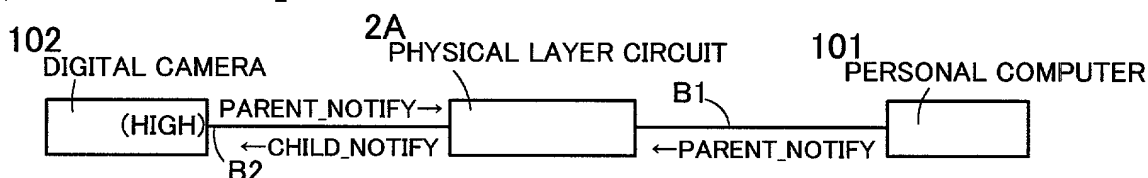FINISHING TREE-IDENTIFYING OPERATION

FIG. 7

TREE-IDENTIFYING OPERATION IN FIRST EMBODIMENT
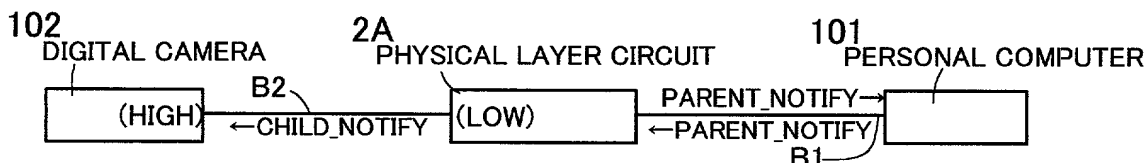(RECEIVE PARENT_NOTIFY BY BOTH PORTS)
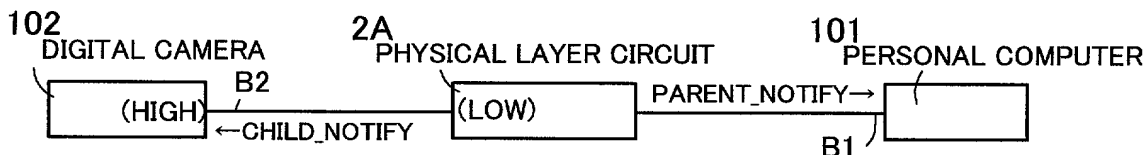
(P7) RECEIVE PARENT_NOTIFY FROM BOTH DEVICES

102 DIGITAL CAMERA
2A PHYSICAL LAYER CIRCUIT
101 PERSONAL COMPUTER

PARENT_NOTIFY→
B1
←PARENT_NOTIFY
B2

(P8) OUTPUT CHILD_NOTIFY TO DIGITAL CAMERA

102 DIGITAL CAMERA
2A PHYSICAL LAYER CIRCUIT
101 PERSONAL COMPUTER

(HIGH) PARENT_NOTIFY→
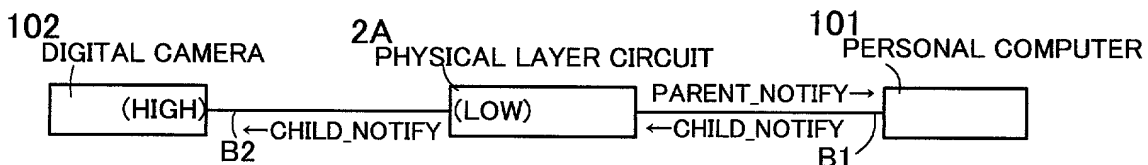←CHILD_NOTIFY
B2
B1
←PARENT_NOTIFY

(P9) STOP OUTPUTTING PARENT_NOTIFY FROM DIGITAL CAMERA TO
THEREBY RECEIVE CHILD_HANDSHAKE, AND OUTPUT PARENT_NOTIFY
TO PERSONAL COMPUTER.
RECEIVE ROOT_CONTENTION WHEN PERSONAL COMPUTER ALSO
OUTPUTS PARENT_NOTIFY AT THIS TIME.

102 DIGITAL CAMERA
2A PHYSICAL LAYER CIRCUIT
101 PERSONAL COMPUTER

(HIGH)
B2
←CHILD_NOTIFY
(LOW)
PARENT_NOTIFY→
←PARENT_NOTIFY
B1

(P10) STOP OUTPUTTING PARENT_NOTIFY FROM PERSONAL COMPUTER
BUT CONTINUOUSLY OUTPUT PARENT_NOTIFY FROM PHYSICAL
LAYER CIRCUIT

102 DIGITAL CAMERA
2A PHYSICAL LAYER CIRCUIT
101 PERSONAL COMPUTER

(HIGH)
B2
←CHILD_NOTIFY
(LOW)
PARENT_NOTIFY→
B1

(P11) OUTPUT CHILD_NOTIFY FROM PERSONAL COMPUTER AFTER
RANDOM TIME, THEREBY RECEIVING PARENT_HANDSHAKE

102 DIGITAL CAMERA
2A PHYSICAL LAYER CIRCUIT
101 PERSONAL COMPUTER

(HIGH)
←CHILD_NOTIFY
B2
(LOW)
PARENT_NOTIFY→
←CHILD_NOTIFY
B1

(P12) FINISH TREE-IDENTIFYING OPERATION

102 DIGITAL CAMERA
2A PHYSICAL LAYER CIRCUIT
101 PERSONAL COMPUTER

(HIGH)
(LOW) (HIGH)
B1
(LOW)
B2